-METASYS®

Unitary Controller (UNT)

The Metasys® Unitary (UNT) Controller is an electronic device for digital control of packaged air handling units, unit ventilators, fan coils, heat pumps, and other terminal units serving a single zone or room. It can also be configured as a generic input/output device for basic point monitoring applications when used within a Metasys Network.

You can easily configure point inputs and outputs and software features to control a wide variety of HVAC equipment applications. You may use the UNT as a standalone controller or connected to the Metasys Network through a Network Control Module (NCM) or Companion™.
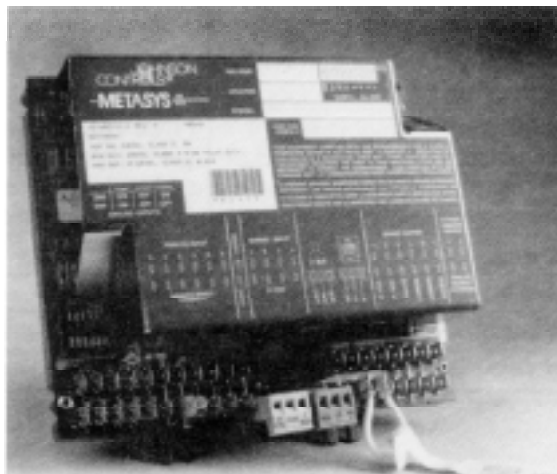

Figure 1: Unitary Controller

Features and Benefits	
❑ **Standalone Control**	System reliability
❑ **Network Communications over N2 Bus**	Facility-wide control efficiencies and cost effective sensor sharing
❑ **Built-in Control Program Library**	No programming
❑ **Isolated N2 Circuitry**	More reliable operation
❑ **Removable N2 and 24 VAC Power Plugs**	Allows disconnection of an individual controller without disrupting other controller connections
❑ **Screw Terminals for I/O Connections Available in Some Models**	"Quick Connect" lugs and crimping tool not required
❑ **Available Pre-mounted in Single High EWC Enclosure with 50 VA Transformer**	Easy to mount on any wall Lockable, ready to go

1

*F*lexible Hardware Packaging

The Unitary Controller is available in different hardware sets to suit environmental and application needs. A list of the controller hardware that is the same is listed below. Following that is a table describing the hardware differences.

Table 1: Unitary Controller Hardware Characteristics--*Similarities*

6 Analog Inputs	RTD temperature elements (1000 ohm nickel, platinum, or silicon) Adjustable 0 to 2K ohm setpoint potentiometers 0 to 5 VDC, 1 to 5 VDC or 0 to 10 VDC transmitters
4 Binary Inputs	(4) 24 VAC input only (24 VAC provided) (1) Momentary pushbutton from zone sensor for temporary occupancy mode (BI 5) BI 4 may be used as an accumulator input for frequencies less than 2 Hz.
Zone Bus (See Table 2 below.)	Removable screw terminal block, LED Indication, 8-pin phone jack on controller
24 VAC Power in Termination	Removable screw terminal block
N2 Bus	Removable screw terminal block, electronically isolated circuitry

Table 2: Unitary Controller Hardware Characteristics--*Differences*

	UNT110-1	UNT111-1	UNT120-1	UNT121-1	UNT140-1	UNT141-1
Operating Temperature Rating	32 to 140°F (0 to 60°C)	32 to 140°F (0 to 60°C)	-40 to 140°F (-40 to 60°C)	-40 to 140°F (-40 to 60°C)	32 to 140°F (0 to 60°C)	32 to 140°F (0 to 60°C)
Analog Outputs: **0 to 10 VDC @ 10 mA**	None	2	None	2	None	2
Binary Outputs: **24 VAC Triacs @ 0.5 amps or 0.8 amps if total power is limited** **Low or High side common selectable**	8	6	8	6	8	6
Zone Bus (See Table 1 above.)					Additional 6-pin Phone Jack	Additional 6-pin Phone Jack
I/O Terminations	Quick Connects (Spade Lugs)	Quick Connects (Spade Lugs)	Quick Connects (Spade Lugs)	Quick Connects (Spade Lugs)	Fixed Screw Terminal Block	Fixed Screw Terminal Block
Available pre-mounted in EWC10 with 24 VAC 50 VA transformer	UNT110-101	UNT111-101			UNT140-101	UNT141-101

*F*lexible Hardware Packaging

The Unitary Controller can be configured to match most applications found in today's fast evolving marketplace. The UNT is available in two different versions, differing in their output point configuration. Each of these two versions are available in models with "Quick Connects" (spade lugs) or screw terminations for input/output points. The versions with "Quick Connects" are also available in low temperature models for rooftop applications. This allows you to economically select a controller to match the needed application.

*C*ontroller Enclosure Options

The controller mounts easily to any surface using either direct mount or a controller enclosure. The common packaging for the UNT Controller is in the ENC100 or EWC10. The UNT120/121 Controller must be installed in the BZ-1000-7 enclosure unless it is mounted within the enclosed low voltage electrical compartment of the mechanical unit being controlled.

The UNT controller can be purchased pre-mounted in an EWC10 enclosure, including a 50 VA transformer (-101 suffix).

*E*asy Monitoring and Diagnostics with the Zone Terminal (AS-ZTU100-1)

The Zone Terminal (ZT) is a person/controller interface developed as an easy-to-use controller adjustment and indication device. The ZT is designed for the user who needs a straightforward method to monitor and adjust setpoints in an HVAC zone. The ZT plugs into the TE-6400 Metastat™ or TE-6100-11 or -12 Zone Sensor to communicate with the UNT Controller.

*C*onvenient Configuration Setup

The UNT Controller doesn't need to be programmed in the traditional sense. Instead, the control algorithms and input/output point assignments are configured with the use of the HVAC PRO for Windows™ software tool.

The HVAC PRO for Windows runs on a laptop computer plugged directly into the UNT Controller, or into a jack at the room sensor or M100C Series Motor Actuator. The jack is connected back to the UNT Controller over a 3-wire cable called a Zone Bus. Programs loaded into the UNT Controller are saved in nonvolatile E^{2}PROM memory, so there is no need to reload software after a loss of power.

A second option allows you to load the configuration from the laptop via the N2 Bus. This option speeds up the initial loading and commissioning process by allowing you to load multiple controllers from one location.

Programming a UNT Controller is a simple matter of responding to a series of "yes-no" and multiple choice questions, and specifying setpoints and other parameters. No previous software programming experience is required.

The UNT Controller has a library of proven control sequences and proportional-integral algorithms that are automatically configured into a total system sequence-of-operation in response to your answers to the questions. Once configured, the UNT Controller's operating parameters, such as setpoints and tuning parameters may be changed from any Metasys operator device.

Metasys Network Configuration

As powerful as the UNT Controller is by itself, your facility benefits even more when UNT Controllers are part of a larger Metasys Network. Each UNT Controller can connect to the Metasys N2 Bus (Figure 2). Either a Network Control Unit or Companion system can be programmed to provide added energy management and supervisory control capabilities, including optimal start, demand limiting, load rolling, runtime totalization, and more.

Metasys Dynamic Data Access™ networking software, available from the Network Control Unit, makes all information from each UNT Controller available throughout the facility. Dynamic Data Access also makes sensor values, operating status, and any other parameter in the UNT Controller available to operators anywhere in your facility.
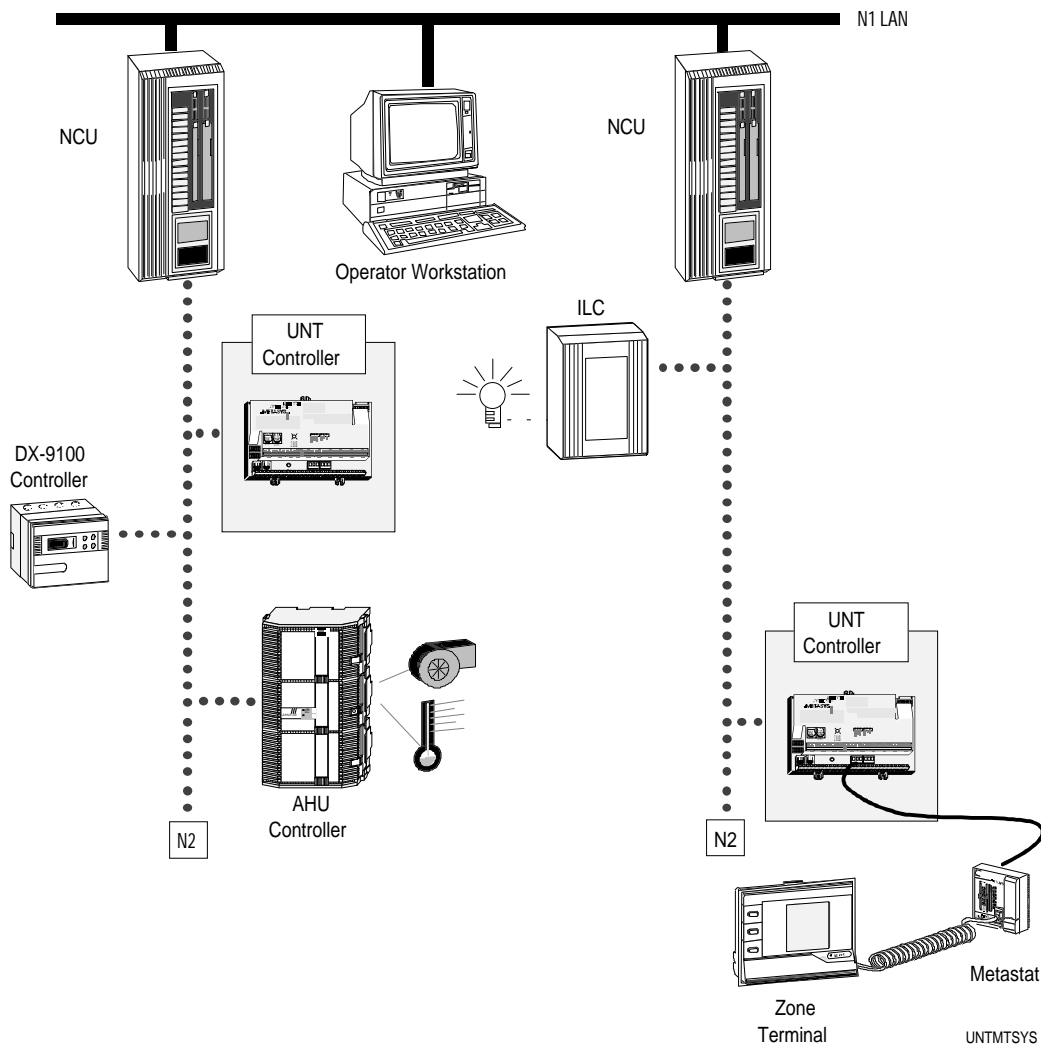

Figure 2: UNT Controller in Metasys Network

Metasys Companion Configuration

Metasys Companion connects to the UNT Controller over an independent N2 Bus (Figure 3). User access is through the Companion System, which implements built-in energy management programs throughout the devices on the bus.
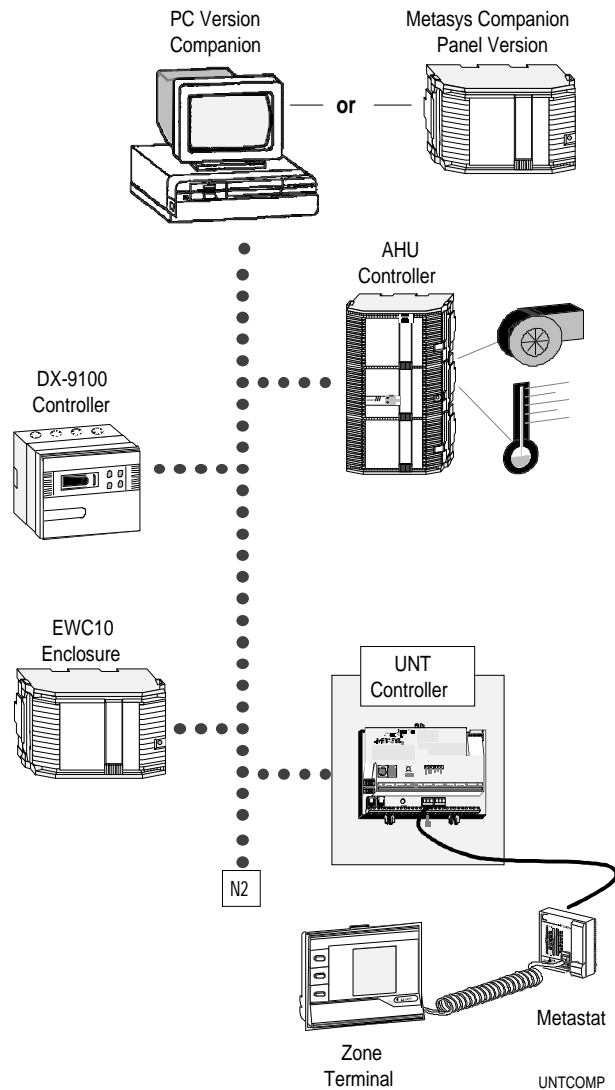

Figure 3: UNT Controller in Companion System

*A*pplication Flexibility

The UNT11n and UNT12n Series with "Quick Connects" are packaged for convenient factory mounting by original equipment manufacturers or for field installations where "Quick Connects" are preferred. The new UNT14n is packaged to accommodate field installations using screw terminations. In addition, points unused in the control scheme can be used in supervisory monitoring and control or standalone applications by the Metasys Network.

The UNT Controller offers a variety of zone sensor connection options that let you select the features you--and your occupants--need. The simplest and most economical option is a solid-state sensing element wired directly to the controller. When this option is chosen, all setpoint adjustments are made using the Operator Workstation or Network Terminal on the Metasys Network, or from the Zone Terminal or Companion system.

A second option provides the occupants in the zone the ability to adjust the setpoint to their preference, within a restricted range established by you. The user setpoint can be overridden by you at any time using the operator interface devices or application programs in the Network Control Unit. This allows maximum energy savings while still allowing occupants some control over their environment.

A third option uses an occupancy sensor to automatically or manually set back or set up zone temperatures when no one is around. This can further increase energy savings in individual offices or conference rooms.

In addition, using the HVAC PRO for Windows software, you can access sideloops that are separate from the main control logic. See your *HVAC PRO for Windows User's Manual* for further explanation of this powerful feature.

Other options provide for control of room lighting as well as temperature, turning lights on or off based on the occupancy sensor, or scheduled commands issued from the network. A Boost mode switch allows an occupant to temporarily provide extra cooling or heating, which is useful for conference rooms that experience large heat load fluctuations.

You can choose to select a Temp Occ mode instead of the Boost mode. Temp Occ mode switch allows an occupant to put the controller into an unscheduled occupied mode for a specified period of time (i.e., go occupied for three hours when the switch is pressed.)
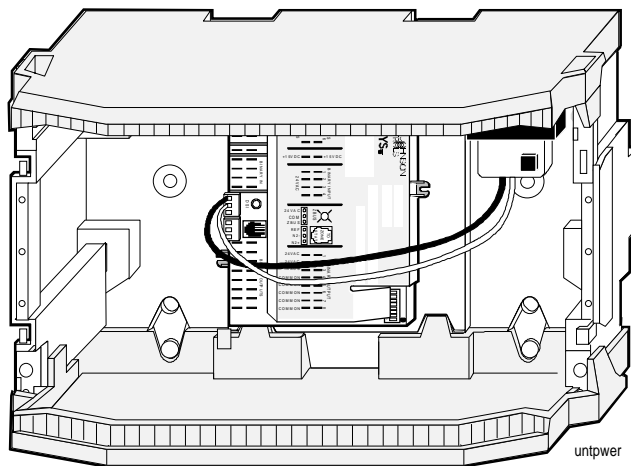

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Figure 4: AS-UNT1nn-101 Enclosure with 50 VA Transformer

Table 3: Applications and Options

Application Classifications	Software Options	
Primary Equipment Types	Unit vents	ASHRAE Cycle 1 ASHRAE Cycle 2 ASHRAE Cycle 3 ASHRAE Cycle W
	Heat pumps	Water to air Air to air
	Packaged rooftops	
	Fan coils	
	Generic point multiplexer	
Primary Control Strategies	Room/zone control	
Economizer Changeover Strategies	Dry bulb	
	Outside air enthalpy	
	Differential outside/return air temperature	
	Outside air and return air enthalpy comparison	
	Binary input from external economizer	
	Supervisory network command	
Mixed Air Control Strategies	Proportional output to OA/RA damper actuator	
	Binary output to economizer actuator	
	Zone bus output to OA/RA damper actuator	
Heating Configuration	Modulated single coil	
	Staged electric heat (3-stage max.)	
	Modulated common heating/cooling coil	
	Reversing valve logic for heat pumps	
	Incremental	
Cooling Configuration	Modulated single coil	
	Staged DX (2-stage max.)	
	Modulated common heating/cooling coil	
	Reversing valve logic for heat pumps	
	Incremental	
Fan Start/Stop	Continuous operation	
	Cycled with call for heating/cooling	
Lighting Control	On and off outputs to lighting relay in conjunction with Occ/Unocc mode	
Unoccupied Control	Setup and setback	
	Morning warmup and cooldown	

*C*onclusion

As either a member of the fully integrated system, or as a standalone controller, the UNT Controller represents a way to optimize the operation of your HVAC equipment.

The UNT Controller combines the best of ease-of-setup and operation, flexibility of application, and precise control for comfort and energy management.

Specifications

Product	**Separate Controllers**
	AS-UNT110-1 / AS-UNT111-1
	AS-UNT120-1 / AS-UNT121-1
	AS-UNT140-1 / AS-UNT141-1
	Pre-mounted Controllers (in an EWC10 enclosure with 50 VA transformer)
	AS-UNT110-101 / AS-UNT111-101
	AS-UNT140-101 / AS-UNT141-101
Ambient Operating Conditions	32 to 140°F (0 to 60°C) and
	-40 to 140°F (-40 to 60°C) for UNT12n-1
	10 to 90% RH
Dimensions (H x W x D)	6.5 in. x 6.4 in. x 2.2 in. (165 x 163 x 56 mm) without enclosure
	9 in. x 16 in. x 7.5 in. (229 x 406 x 191 mm) with AS-ENC100 enclosure
Ambient Storage Conditions	-40 to 158°F (-40 to 70°C)
	10 to 90% RH
Power Requirements	24 VAC, 50/60 Hz at 40 VA (per typical system)
Shipping Weight	1.4 lb (0.64 kg)
Standards Compliance	IEEE 472 IEEE 518 IEEE 587 Category A
	FCC Part 15, Subpart J, Class A
	UL 916 UL 864
Agency Listings	UL Listed and CSA Certified as part of the Metasys Network.
Accessories (Order Separately)	
Power Supply	(AS-XFR100) or (EN-EWC15-0)
Zone Terminal	(AS-ZTU100-1)
Enclosure Kit	(AS-ENC100-0) or (EN-EWC10-0) or (EN-EWC15-0) or (BZ1000-7)
HVAC PRO Interface	(AS-CBLPRO-2)
N2 Plugs/Power Plugs Replacement Kit	(AS-TBKIT-0) (Kit consists of five of each plug type.)
Zone Sensors	(TE-6400 Series)
Converter	(MM-CVT101-0)

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

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